~~R-001-209.1~~
G-000-209.1

153

FINAL REPORT FOR SURFACE RADIOLOGICAL SURVEY OF EFFLUENT LINE MANHOLES

06-29-89

ASI/DOE
27
REPORT

153

[redacted] 6-000-209.1

June 28 1989

Department of Energy
ATTN: Mary Stone
P. O. Box 398704
Cincinnati, OH 45239

Subject: Final Report for Surface Radiological Survey of Effluent Line Manholes

Enclosed is the final report for the surface radiological survey of the effluent line manholes to the Great Miami River. A chronological summary of the events that led up to the survey and the survey procedures are presented in the cover letter to the data sheets. The data sheets included within the report identify the SPA-3 and Fidler readings obtained during the survey walkover. Locations for soil sampling were also identified.

If you should have any questions concerning this report, please contact either R. Galbraith at 738-3100 or J. Whitesides at 615-690-3211.

Sincerely,

Robert G. Lenyk
Project Manager

RGL/heb

cc: J. Craig
R. Conner
R. Kasparek
R. Galbraith
J. Whitesides

10845 HAMILTON CLEVES ROAD • P.O. BOX 475 • ROSS, OHIO 45061 • (513) 738-3100
2620 SAN MATEO NE, SUITE D • ALBUQUERQUE, NEW MEXICO 87110 • (505) 883-0959
2000 NORTH 15TH STREET, SUITE 407 • ARLINGTON, VA 22201 • (703) 243-4900
7308 S. ALTON WAY, SUITE K • ENGLEWOOD, CO. 80112 • (303) 779-0314
107-F JEFFERSON AVE. • OAK RIDGE, TN 37830 • (615) 483-1274
Advanced Sciences, Inc.

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INTERNATIONAL TECHNOLOGY CORPORATION

Memorandum

To: Bob Galbraith

Date: June 23, 1989

From: Laura Whitesides and Jeff Whitesides

Subject: **MANHOLE AREA SURVEYS**

On May 3,1989, Bob Galbraith of IT/Fernald called to request radiation surveys around 6 to 8 manholes of the liquid effluent line at the FMPC.

Jeff Whitesides and Laura Tryboski reported to the ASI/Fernald office the morning of May 4, 1989. A meeting was held to discuss the survey procedures. Present were Dennis Carr, Dick Kasparek, and Kim Eilerman from WMCO; Bob Lenyk and Ray Meyer from ASI; Jeff Whitesides and Laura Tryboski from IT. Dennis Carr presented a scope of work outlining procedures to be used to survey manholes #180 and 181. Four more manholes were added on May 5: # 176, 177, 178, and 179. The areas around the manholes were to be surveyed using a SPA-3 survey instrument following similar procedure outlines as used previously in the radiation measurements task of the RI/FS. Additional surveys using a FIDLER were performed at the manhole areas during May 6 and 7, at the request of Bob Conners of WMCO. Radiation surveys were performed from May 4 to May 7. Copies of all field data sheets are attached.

Source and background checks of survey instruments were performed daily. Background was measured outside at the west-end of the ASI office on the ground surface. The surface soil activity at this location was assumed to be an average background activity for the Fernald area. Source calibration and checks for the FIDLER instrument were performed using an Am-241 source (#679), and a Cs-137 source (#1) was used for calibration and checks of the SPA-3 survey instruments.

The principal goal of performing radiation surveys in these areas was to identify the areal extent of any above-background surface radiation levels. Background count rates measured at the ASI office are shown below in Table 1. In comparison with field radiation survey measurements as summarized in Table II, the average background measurements are exceeded only for FIDLER measurements.

TABLE I
BACKGROUND SURFACE MEASUREMENTS
(cpm)

Serial Number	5/4/89	5/5/89	5/6/89	5/7/89	Average
SPA3					
23/1795	1.42E4	1.13E4	1.18E4	---	1.24E4
20/1794	1.51E4	1.15E4	---	1.13E4	1.26E4
FIDLER					
A303K/52838	---	---	1070	1033	1051

TABLE II
COMPARISON OF BACK GROUND SURFACE
RADIATION SURVEY MEASUREMENTS

Serial # Probe/ Rate meter	Bkgd (cpm)	Bkgd count	Highest Count for a Subgrid at each Manhole					
			#176 (2)*	#177 (3)*	#178 (0)*	#179 (4)*	#180 (32)*	#181 (16)*
23/1795	1.24E4	2.48E4/2min	-	-	-	-	2.24E4	-
20/1794	1.26E4	2.52E4/2min	2.10E4	1.98E4	1.78E4	1.81E4	2.36E4	1.81E4
A303K/52838	1051	3153/3min	4339	3861	-	3255	4326	3320

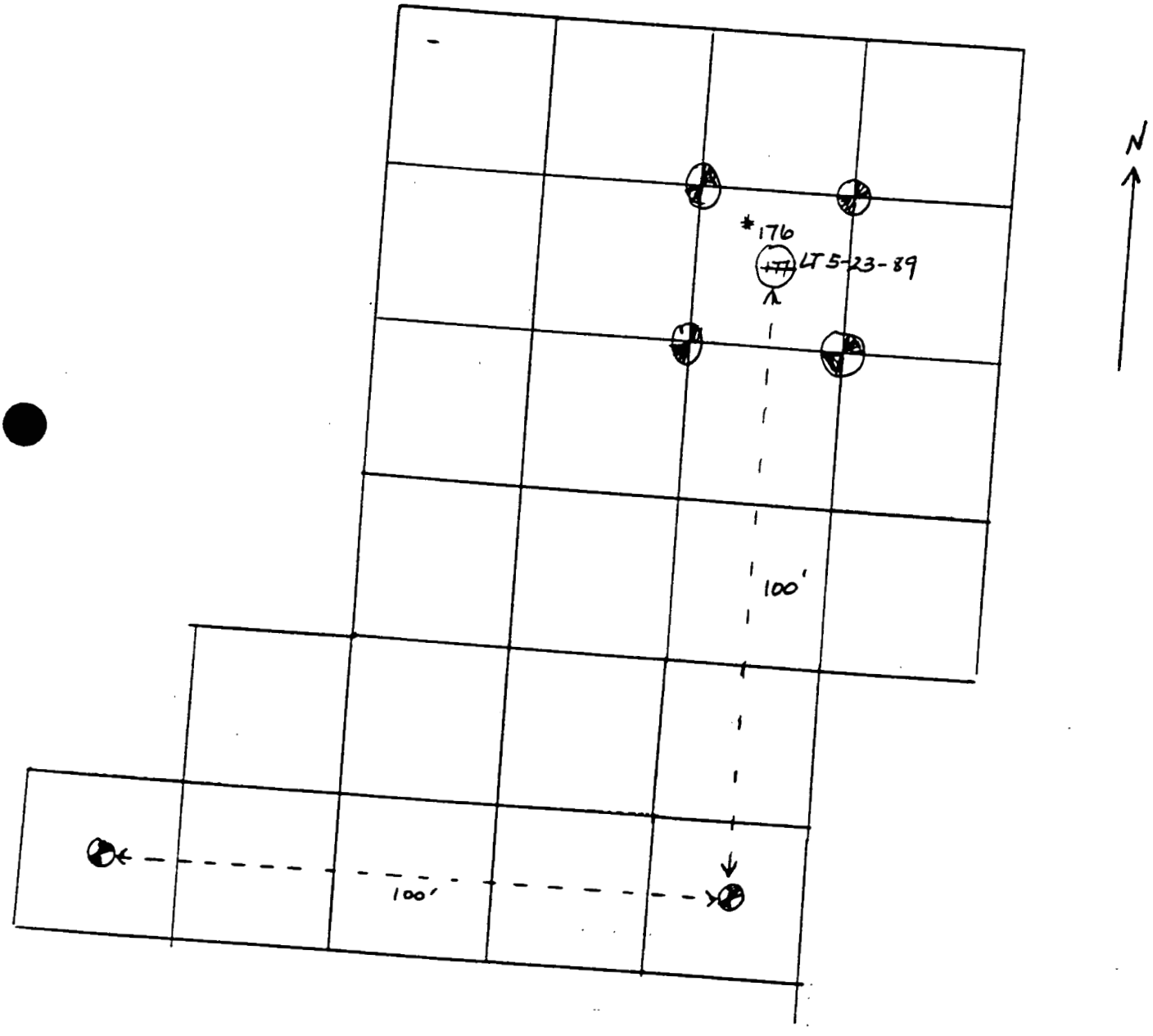
* number of 25ft X 25ft subgrids surveyed with A303K/53838.

Surface soil sampling locations were selected at areas of suspected high concentrations from elevated survey measurements or trends in survey measurements, and also at areas where water overflow from a manhole could have collected. Since radiation survey instruments would detect uranium-238 activity in soil above approximately 35 pCi/gram, and since the uranium concentrations appeared to be less than 35p Ci/g, then determination of uranium concentrations in the soil will be made by laboratory analyses.

cc: John Frazier

INTERNATIONAL TECHNOLOGY CORPORATION

By LJT Date 5-7-89 Subject Manhole # ~~177~~ #176 LT 5-23-89
Chkd. By ____ Date ____ Soil Sample Locations Sheet No. 1 of 1
Proj. No. 303317.09.2



⊕ - SAMPLE LOCATION
6 TOTAL

FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	7	8	9
TIME	1	4	5	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole ~~177~~ LT 5/23/89 #176

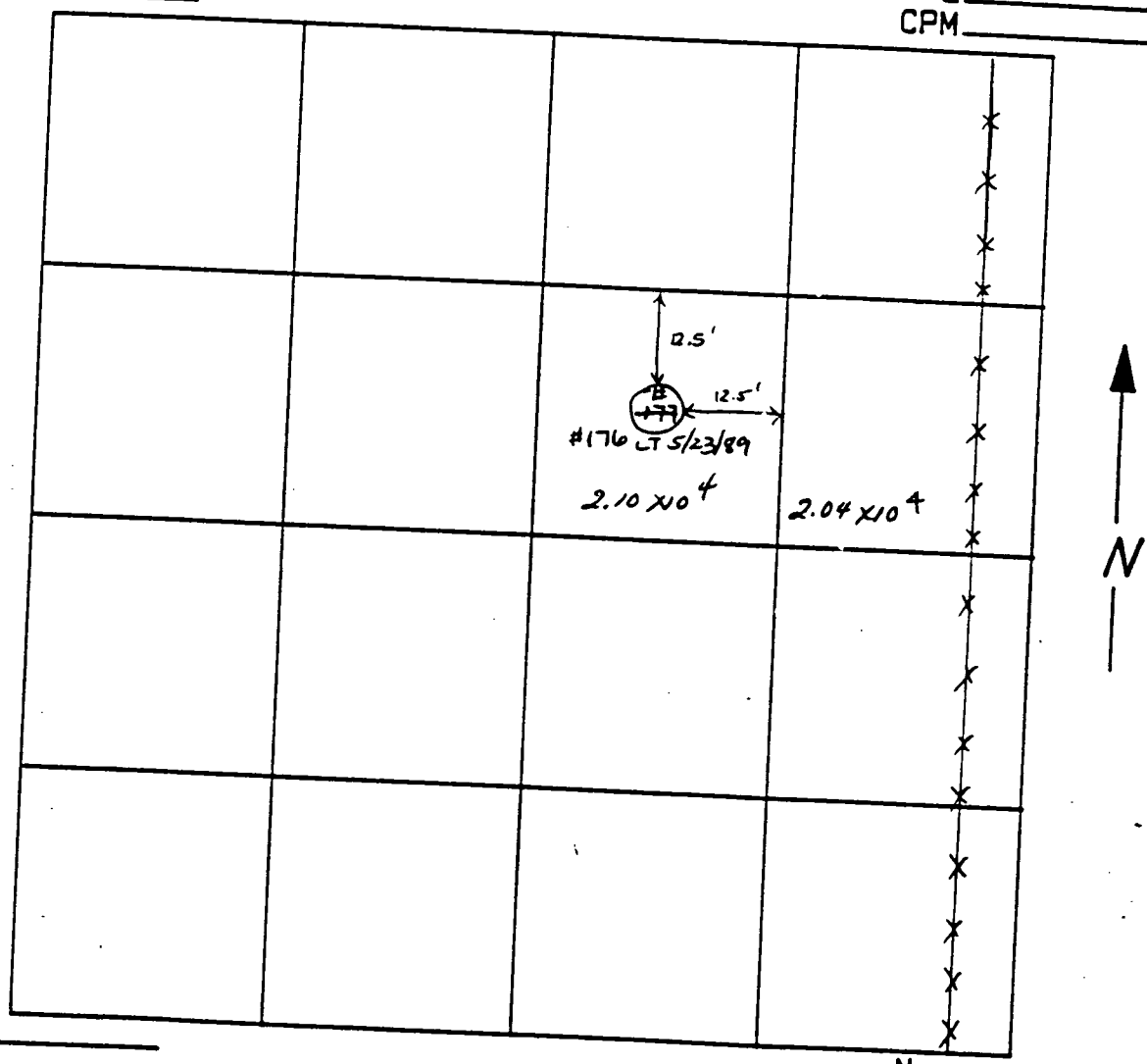
SURVEYORS: J. WHITESIDES

RECORDED BY: L. TRYBOSKY

COUNT TIME: 2 MIN BACKGROUND: 1.13×10^4 CPM

N
E
CPM

N
E
CPM



N
E
CPM

N
E
CPM

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure ASL 2003 Rev. 1

SPA3

SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 20

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FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	7	8	9
TIME	1	4	5	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole ~~#79~~ #176 LT 5/23/89

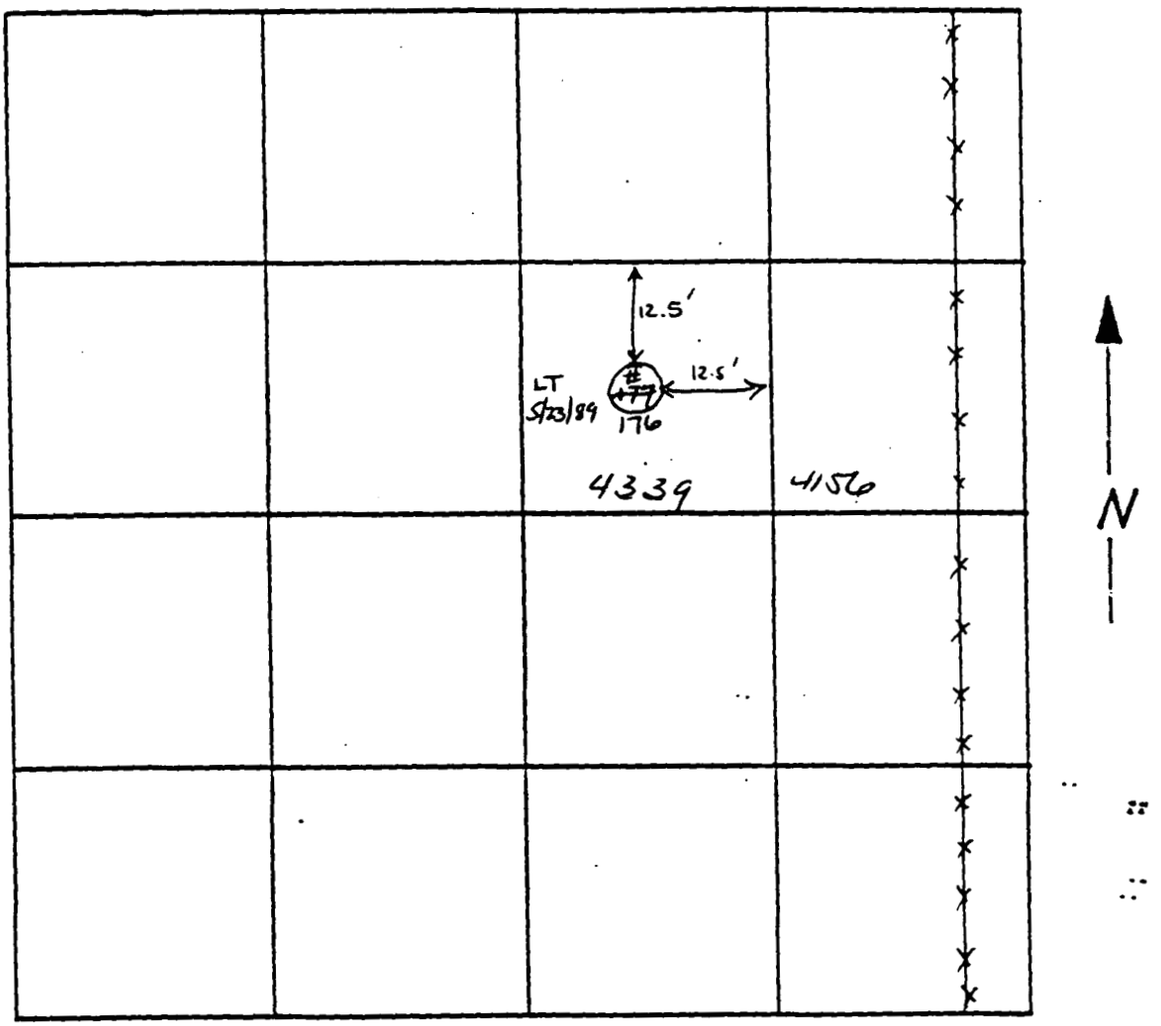
SURVEYORS:

RECORDED BY:

COUNT TIME: 3 MIN BACKGROUND: 1033 CPM

N N

E E



N N

E E

COMMENTS: FIDLER integrated counts in a 25' x 25' grid in accordance with procedure RSL 2004.

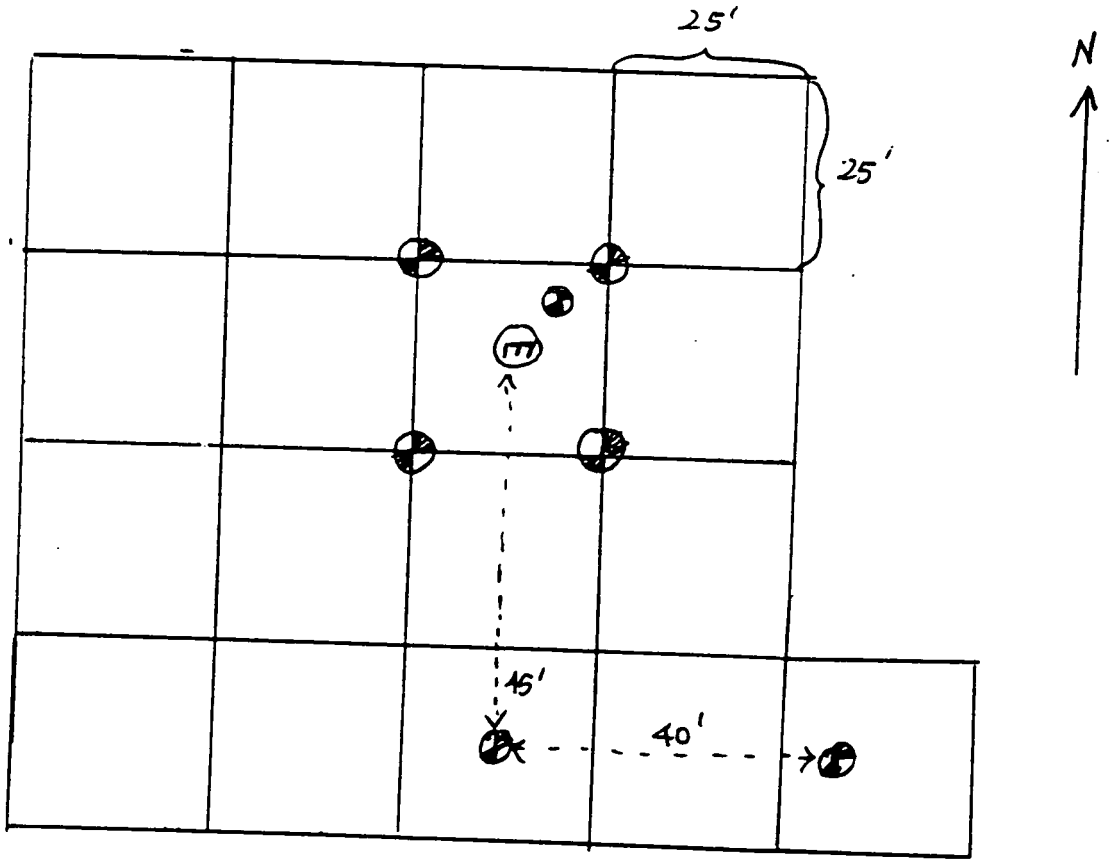
SCALER MODEL 2220 SERIAL NO. 52838 L

PROBE MODEL G5 SERIAL NO. A303K

FIDLER

INTERNATIONAL TECHNOLOGY CORPORATION

By LJT Date 5-7-89 Subject Manhole 177 Sheet No. 1 of 1
Chkd. By ____ Date ____ Soil Sample Locations Proj. No. 303317.09.24



● - SAMPLE LOCATIONS
7 TOTAL

FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	7	8	9
TIME	1	3	3	5		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole ~~198~~ 177 LT 5/23/89

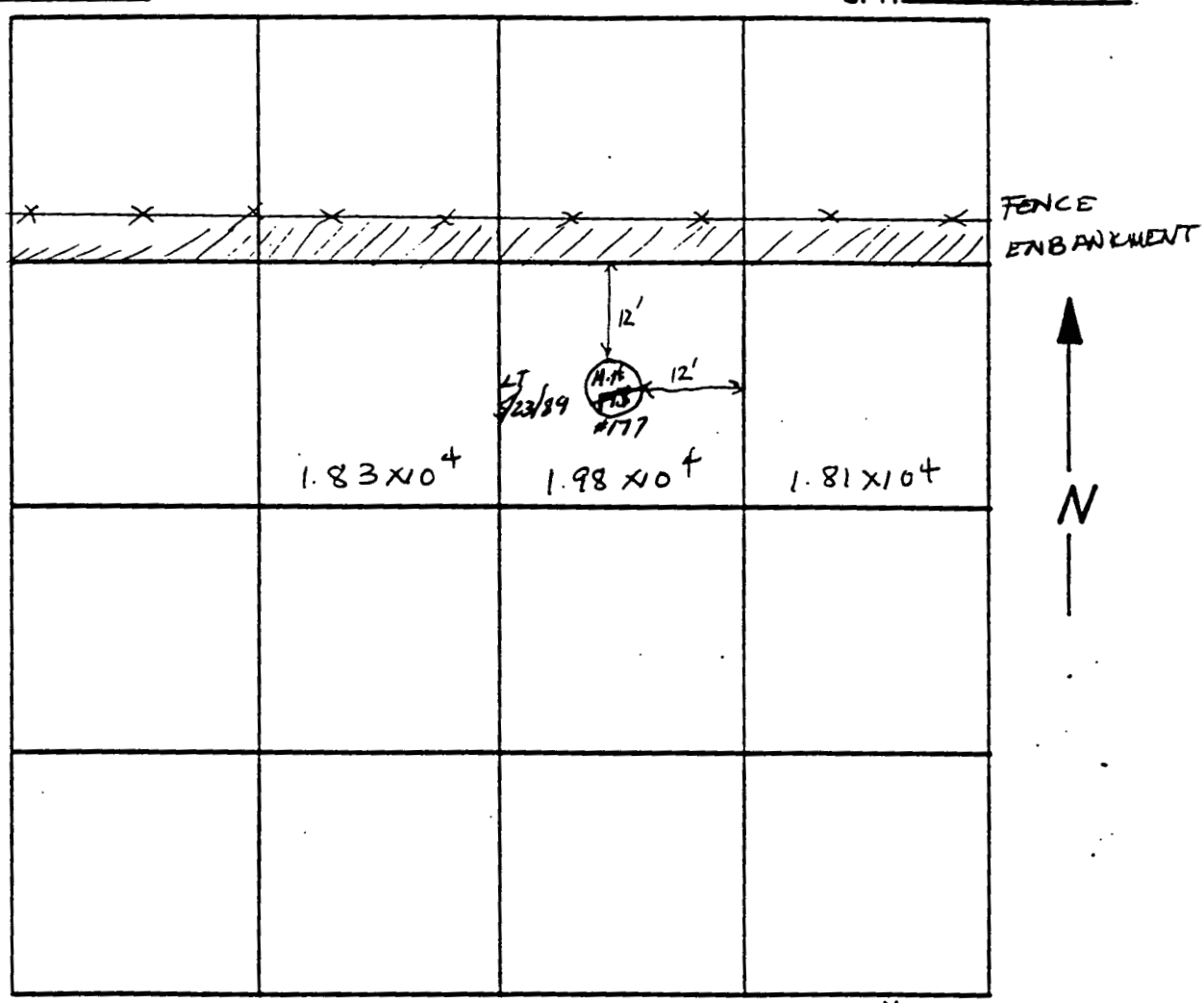
SURVEYORS: J. WHITESIDES

RECORDED BY: L. ~~TRY~~ BOSKY

COUNT TIME: 2 MIN. BACKGROUND: 1.13×10^4 CPM

N ____ E ____ CPM 7.94×10^3

N ____ E ____ CPM 8.34×10^3



N ____ E ____ CPM ____

N ____ E ____ CPM ____

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure RSL 2003 Rev. 1

SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 20

SPA3

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FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	7	8	9
TIME	1	3	2	5		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole ~~#178~~ 177 LT 5/23/89

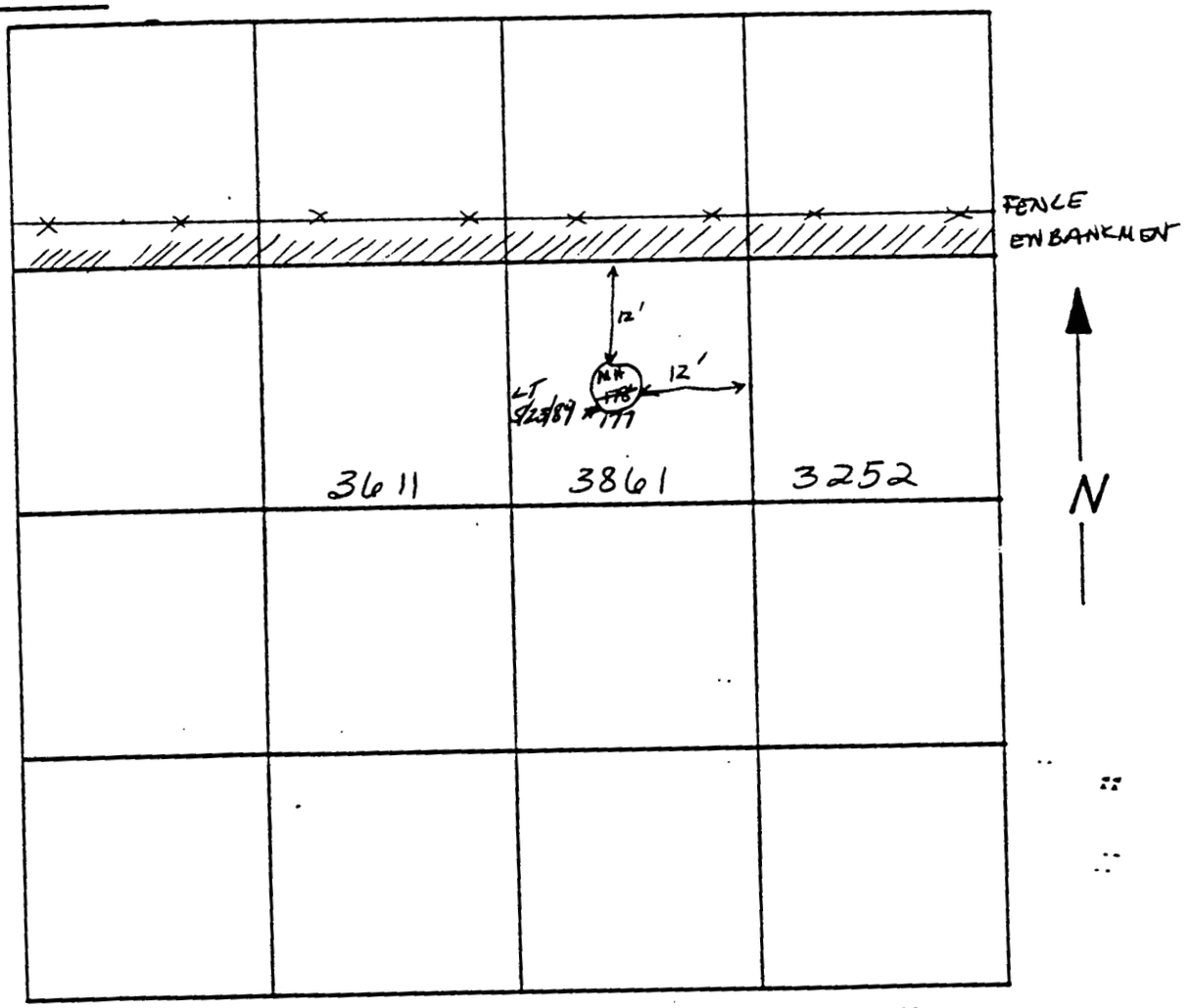
SURVEYORS: L. TRUBOSKY

RECORDED BY: J. WHITESIDES

COUNT TIME: 3 MIN. BACKGROUND: 1033 CPM

N_____ N_____

E_____ E_____



N_____ N_____

E_____ E_____

COMMENTS: FIDLER integrated counts in a 25' x 25' grid in accordance with procedure RSL 2004.

SCALER MODEL 2220 SERIAL NO. 52838

PROBE MODEL G5 SERIAL NO. A303K

FIDLER

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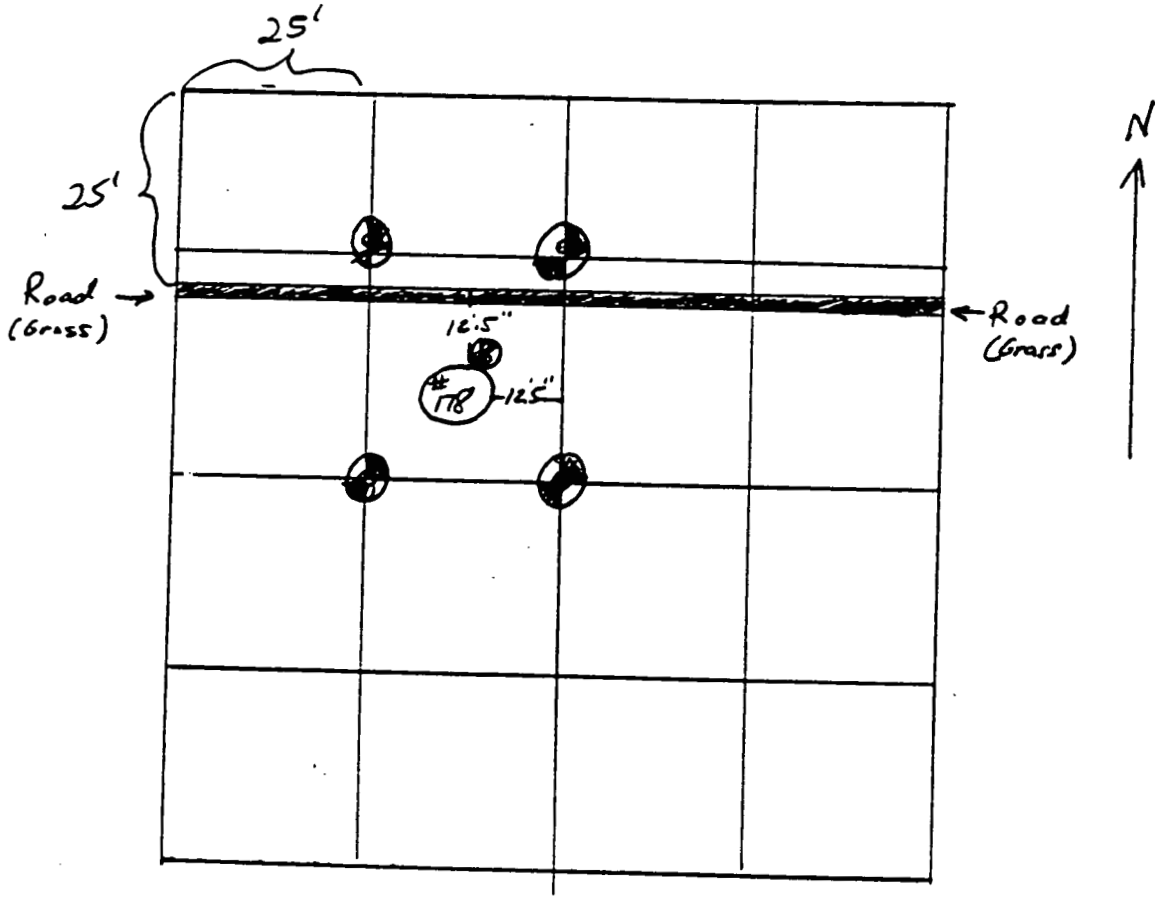
INTERNATIONAL TECHNOLOGY CORPORATION

By LJT Date 5-7-89 Subject Manhole ~~#176~~ #178 LT 5/23/89 Sheet No. 1 of 1

Chkd. By ____ Date ____ Soil Sample Locations Proj. No. 303317.09.2



● - SAMPLE LOCATIONS
5 TOTAL

10

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FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	7	8	9
TIME	1	6	2	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole # ~~176~~ LT 4/23/89 #178

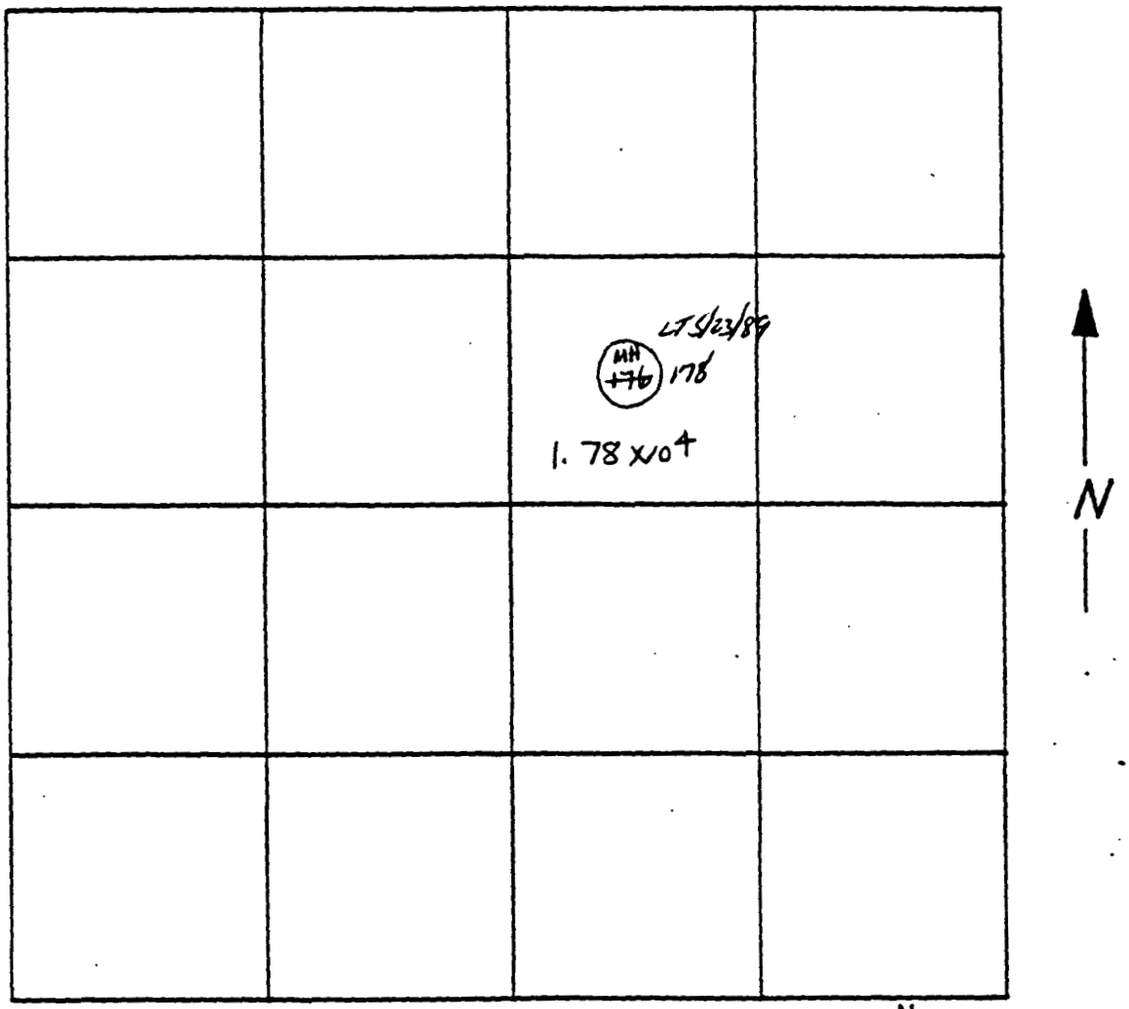
SURVEYORS: J. WHITESIDES

RECORDED BY: L. TRYBOSKI

COUNT TIME: 2 MIN. BACKGROUND: 1.13 X 04 CPM

N
E
CPM

N
E
CPM



N
E
CPM

N
E
CPM

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure ASL 2003 Rev. 1

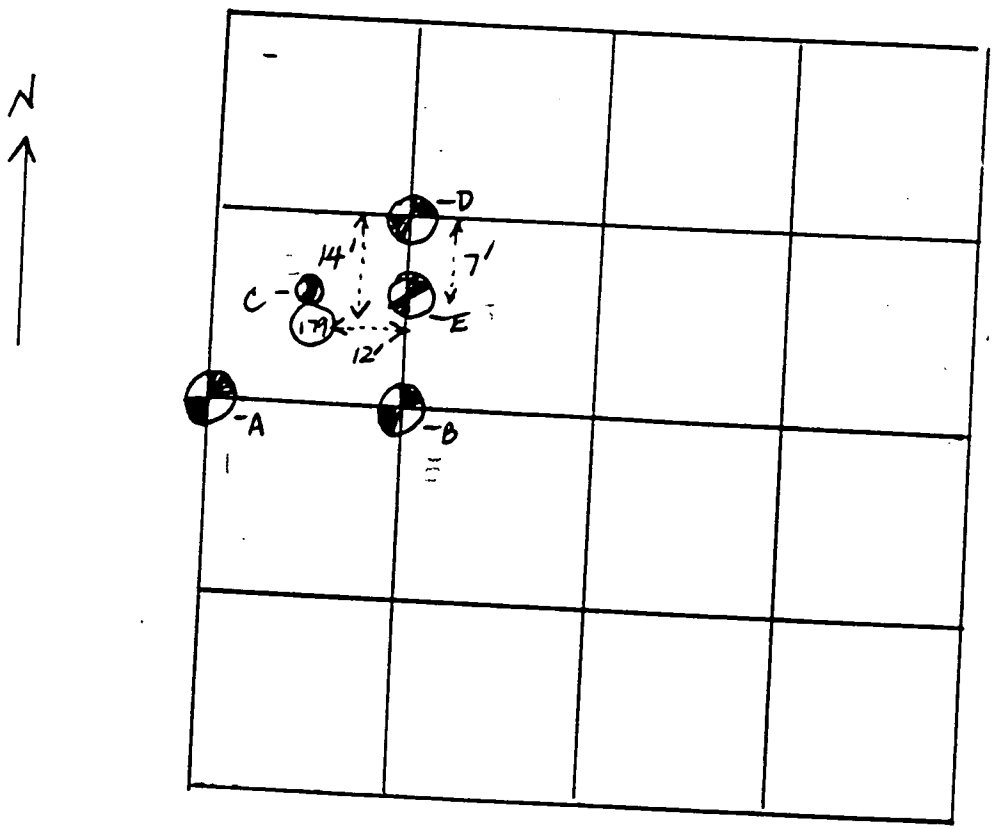
SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 20

SPA3

INTERNATIONAL TECHNOLOGY CORPORATION

By LJT Date 5-7-89 Subject Manhole #179 Sheet No. 1 of 1
Chkd. By ____ Date ____ Soil Sample Locations Proj. No. 303317.09



⊕ - SAMPLE LOCATIONS 5 TOTAL

SURFACE RADIATION MEASUREMENTS

	SPA-3 (1794/20)	FIDLER (A303K/52838)	ppm U (0-...
⊕-A	8.51×10^3 CPM	964 CPM	<11
⊕-B	9.55×10^3 CPM	1040 CPM	<11
⊕-C	8.47×10^3 CPM	825 CPM	<11
⊕-D	8.20×10^3	842 CPM	11 12
⊕-E	1.03×10^4	1040 CPM	12

FERNALD RI/FS

Surface Measurements Field Logbook Form

DATE	0	5	0	7	8	9
TIME	0	9	3	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: MANHOLE #179

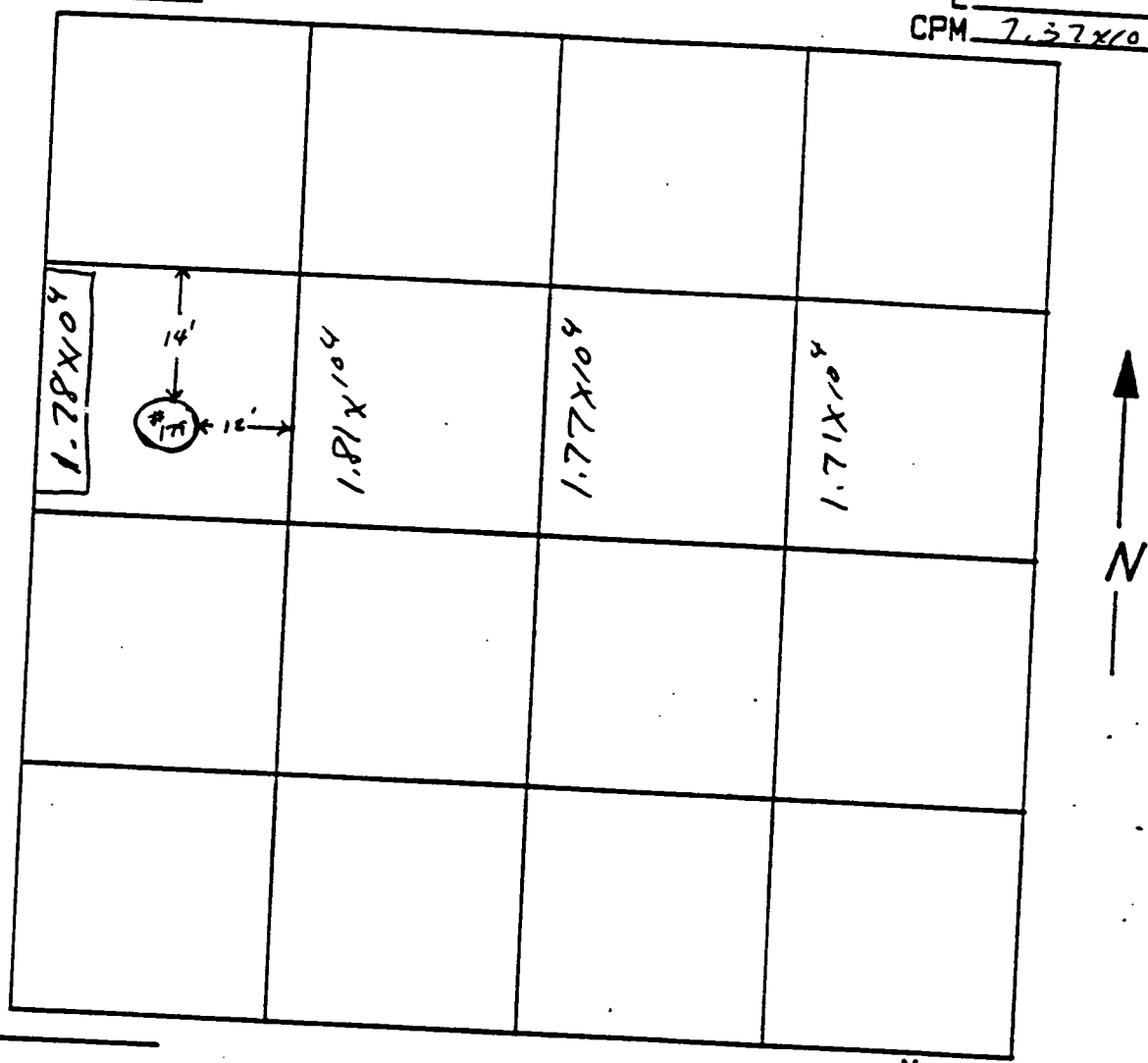
SURVEYORS: J. WHITESIDES, L. TRUBOSKI

RECORDED BY: L. TRUBOSKI, J. WHITESIDES

COUNT TIME: 2 MIN. BACKGROUND: 1.13×10^4 CPM

N
E
CPM 7.35×10^3

N
E
CPM 7.37×10^3



N
E
CPM

N
E
CPM

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure ASL 2003 Rev. 1

SPA3

SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 20

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FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	7	8	9
TIME	0	9	3	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole # 179

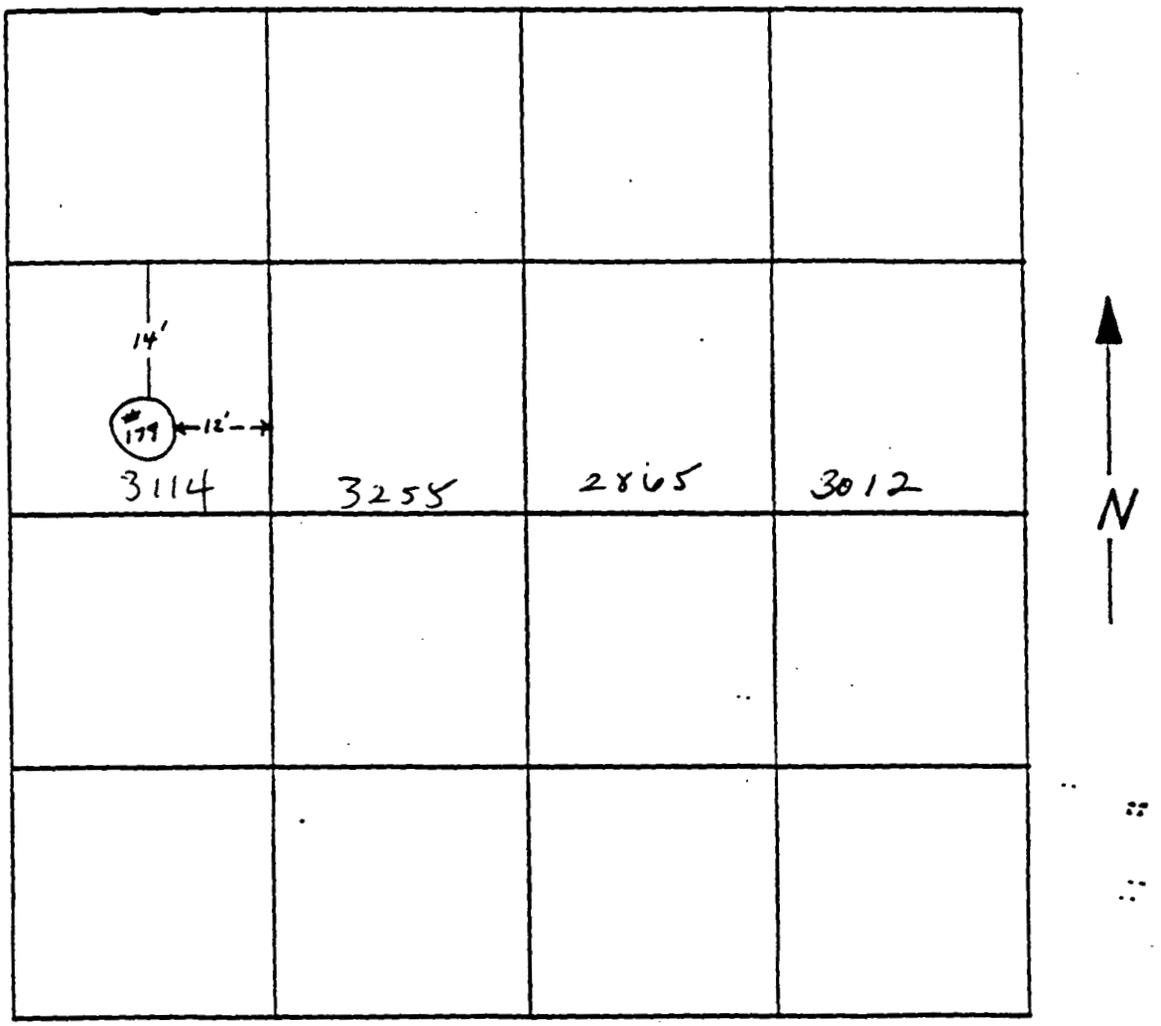
SURVEYORS: L. Trybosti, J. Whitesides

RECORDED BY: J. Whitesides, L. Trybosti

COUNT TIME: (3 MIN.) BACKGROUND: 1033 CPM

N____ N____

E____ E____



N____ N____

E____ E____

COMMENTS: *FIDLER integrated counts in a 25' x 25' grid in accordance with procedure RSL 2004.*

SCALER MODEL 2220 SERIAL NO. 52138

PROBE MODEL G5 SERIAL NO. A5036

FIDLER

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INTERNATIONAL TECHNOLOGY CORPORATION

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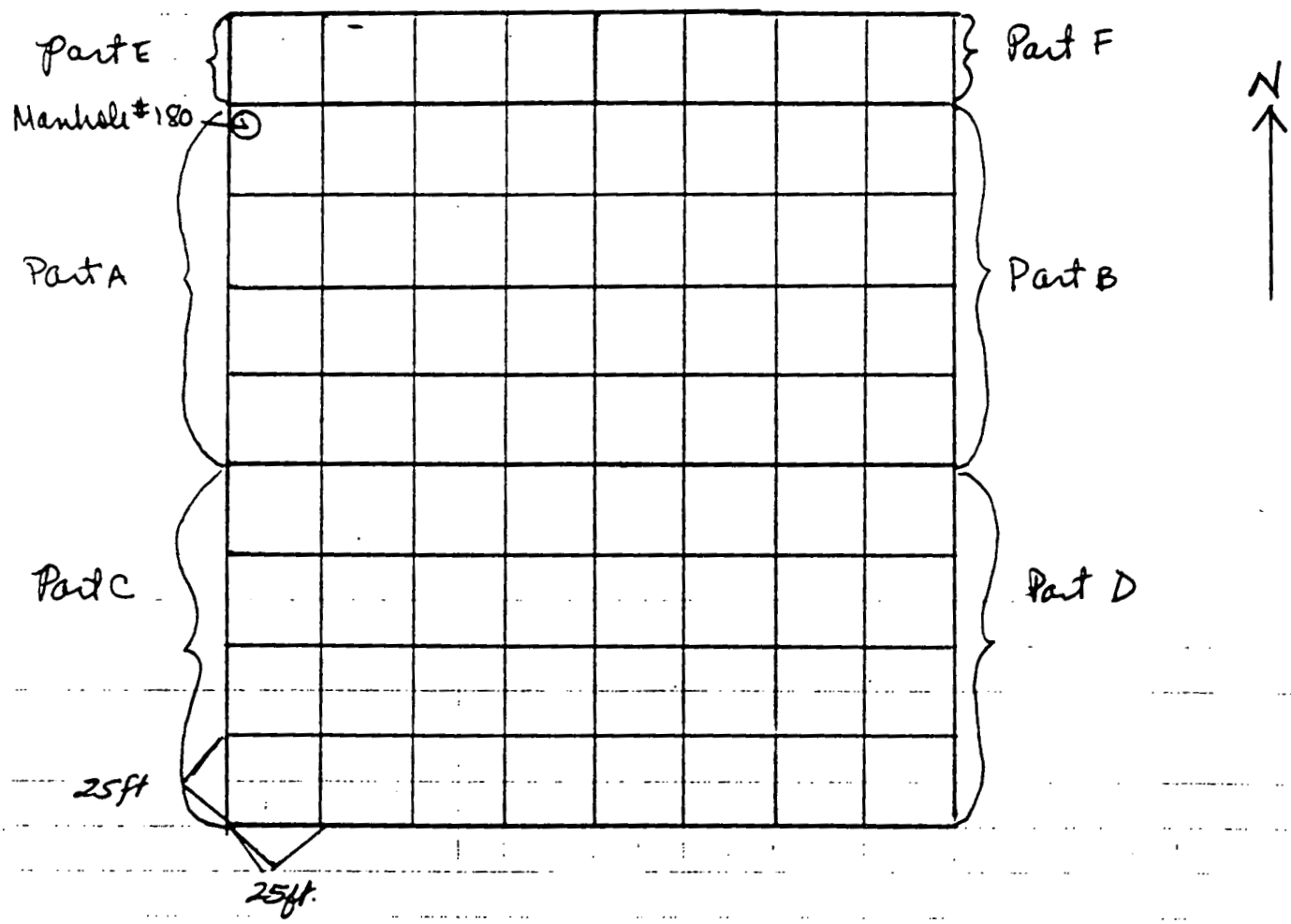
By LJT Date ~~5-4-89~~ 6-26-89 Subject Manhole 180 Grid Locations Sheet No. 1 of 1

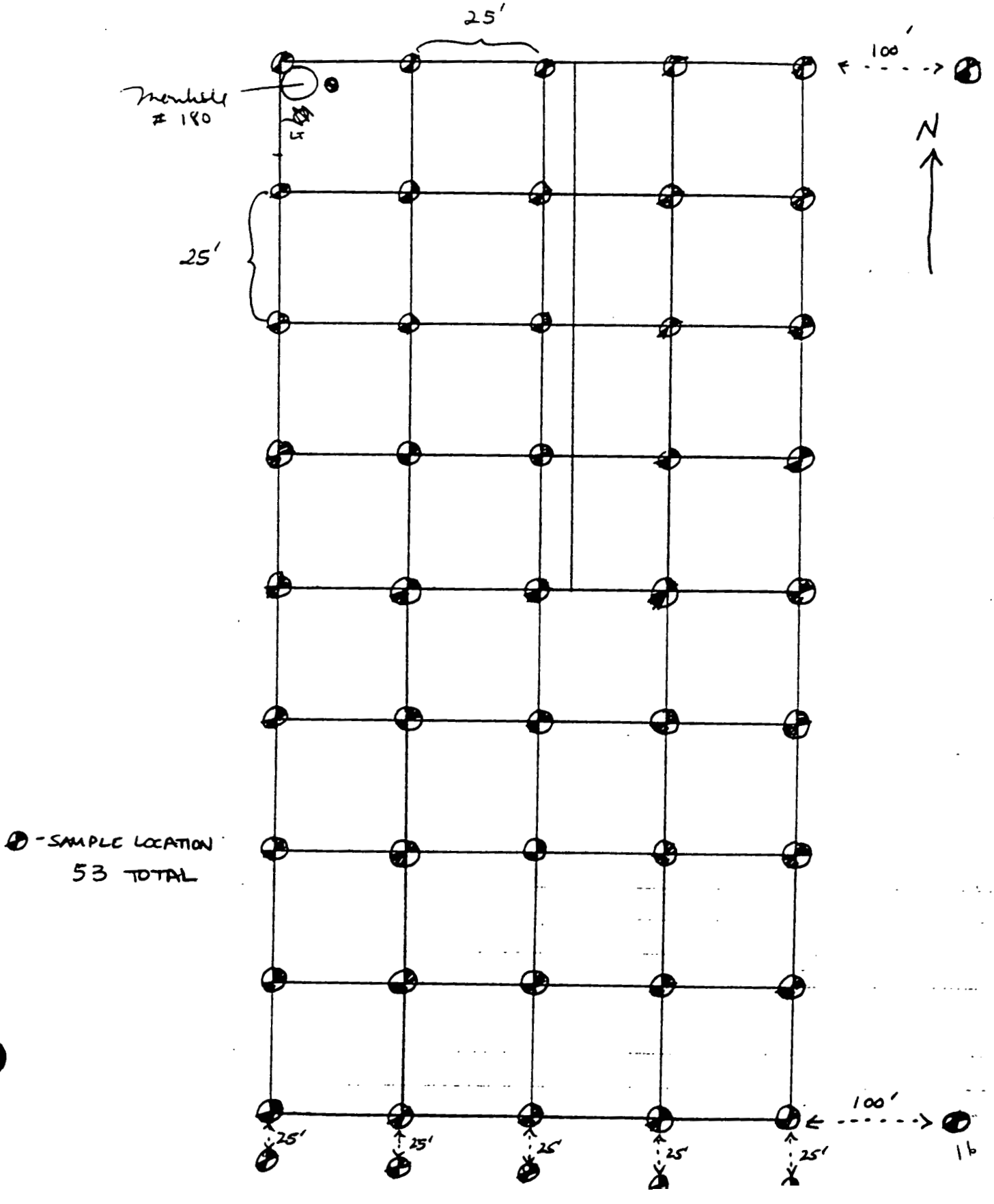
Chkd. By ____ Date ____ Proj. No. 303847.09.29



INTERNATIONAL TECHNOLOGY CORPORATION

By LJT Date 5-7-89 Subject Manhole 180 Sample Locations Sheet No. 1 of 1

Chkd. By ____ Date ____ Proj. No. 303317 09-2



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FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0 5 0 4 8 9
TIME	1 6 0 0
PAGE	OF
PAGE	
CHKD. BY	

SITE: FMPC AREA: Manhole 180 Pad A

SURVEYORS: L. TRYBOSKI

RECORDED BY: L. TRYBOSKI, J. WHITESIDES

COUNT TIME: 2 MIN. BACKGROUND: 1.51×10^4 CPM

N
E
CPM 8.24×10^3

N
E
CPM 8.53×10^3

Manhole 180

1.55×10^4	1.27×10^4	1.33×10^4	1.44×10^4
1.93×10^4	1.61×10^4	1.49×10^4	1.61×10^4
1.65×10^4	1.82×10^4	1.94×10^4	2.15×10^4
2.04×10^4	2.07×10^4	2.19×10^4	2.29×10^4

N

N
E
CPM 1.11×10^4

N
E
CPM 1.12×10^4

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure ASL 2003 Rev. 1

SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 20

SPA3

FERNALD RI/FS

Surface Measurements Field Logbook Form

DATE	0	5	0	4	8	9
TIME	1		6	0	0	
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole 180 Part B

SURVEYORS: J. WHITESIDES

RECORDED BY: L. TRYBOSKI, J. WHITESIDES

COUNT TIME: 2 MIN. BACKGROUND: 1.42×10^4 CPM

N
E
CPM 2.93×10^3

N
E
CPM 9.61×10^3

2.05×10^4	2.05×10^4	1.98×10^4	1.87×10^4
2.17×10^4	2.15×10^5	2.16×10^4	2.10×10^4
2.19×10^4	2.19×10^4	2.20×10^4	2.19×10^4
2.23×10^4	2.21×10^4	2.23×10^4	2.23×10^4

N

N
E
CPM 1.03×10^4

N
E
CPM 1.04×10^4

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure ASL 2003 Rev. 1

SPA3

SCALER MODEL ESP-1 SERIAL NO. 1795

PROBE MODEL SPA-3 SERIAL NO. 23

FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	5	8	9
TIME	1		0	3	0	
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole 180 PntC

SURVEYORS: S. WHITESIDES, L. TRYBOSKI

RECORDED BY: L. TRYBOSKI

COUNT TIME: 2 MIN. BACKGROUND: 1.15×10^4 CPM

N ____ E ____ CPM 9.70×10^3

N ____ E ____ CPM 1.04×10^4

2.18×10^4	2.20×10^4	2.22×10^4	2.27×10^4
2.18×10^4	2.29×10^4	2.31×10^4	2.31×10^4
2.16×10^4	2.28×10^4	2.28×10^4	2.26×10^4
2.26×10^4	2.36×10^4	2.32×10^4	2.28×10^4

N

N ____ E ____ CPM 1.07×10^4

N ____ E ____ CPM 1.11×10^4

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure RSL 2003 Rev. 1

SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 20

SPA3

FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	6	0	5	8	9
TIME	1	0	3	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole 180 Part D

SURVEYORS: J. WHITESIDES, L. TRYBOSKI

RECORDED BY: L. TRYBOSKI

COUNT TIME: 2 MIN. BACKGROUND: 1.13×10^4 CPM

N
E
CPM 1.15×10^4

N
E
CPM 1.02×10^4

2.22×10^4	2.18×10^4	2.20×10^4	2.18×10^4
2.23×10^4	2.22×10^4	2.21×10^4	2.19×10^4
2.23×10^4	2.23×10^4	2.24×10^4	2.17×10^4
2.22×10^4	2.23×10^4	2.23×10^4	2.20×10^4

N

N
E
CPM 1.10×10^4

N
E
CPM 1.11×10^4

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure RSL 2003 Rev. 1

SCALER MODEL ESP-1 SERIAL NO. 1795

PROBE MODEL SPA-3 SERIAL NO. 23

SPA3

FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	4	8	9
TIME	1	7	5	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole 180 Part E

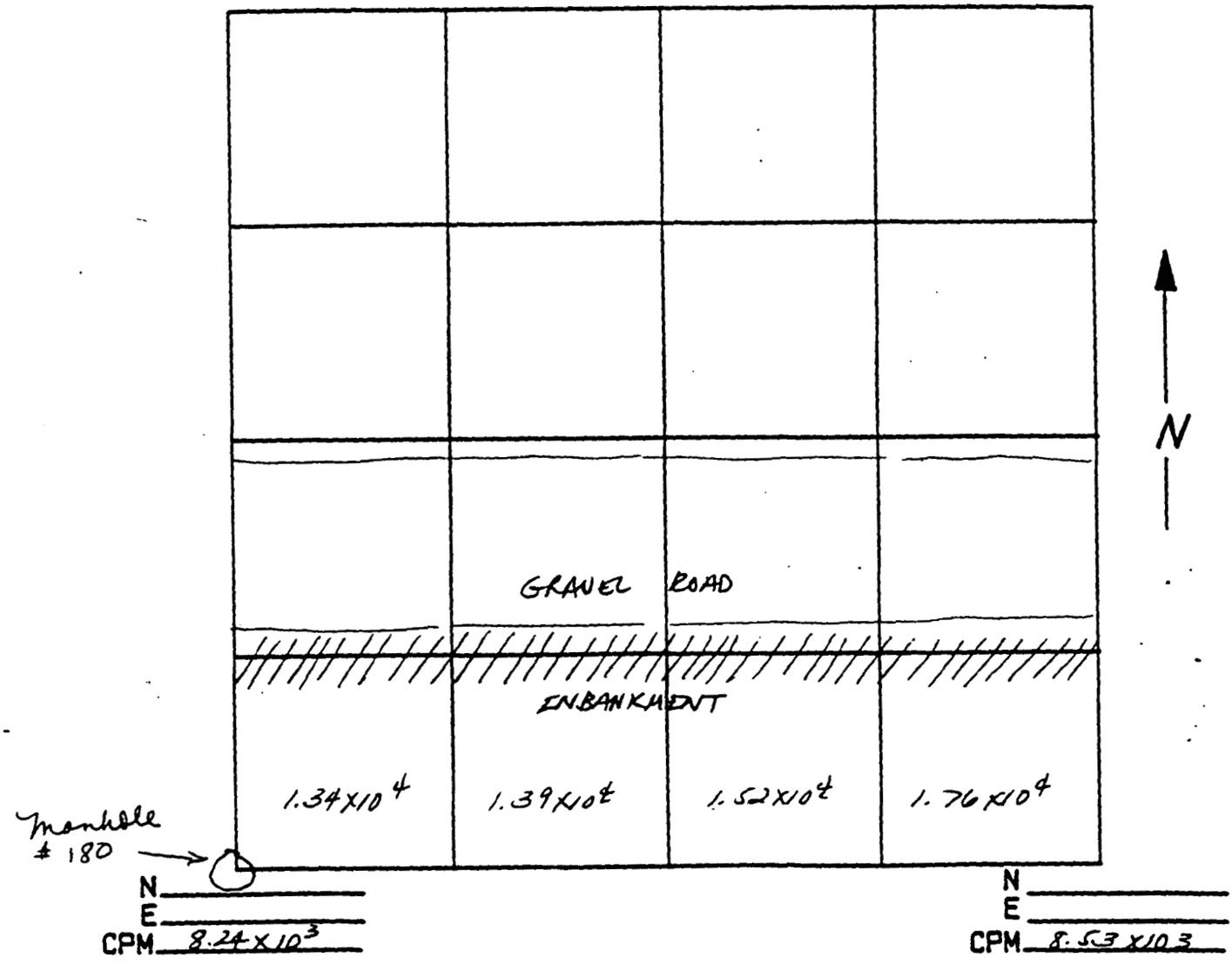
SURVEYORS: L. TRYBOSKI

RECORDED BY: L. TRYBOSKI

COUNT TIME: 2 MIN. BACKGROUND: 1.51×10^4 CPM

N
E
CPM

N
E
CPM



N
E
CPM 8.24×10^3

N
E
CPM 8.53×10^3

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure ASL 2003 Rev. 1

SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 30

SPA3

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FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	4	8	9
TIME	1	4	5	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole 180 Part F

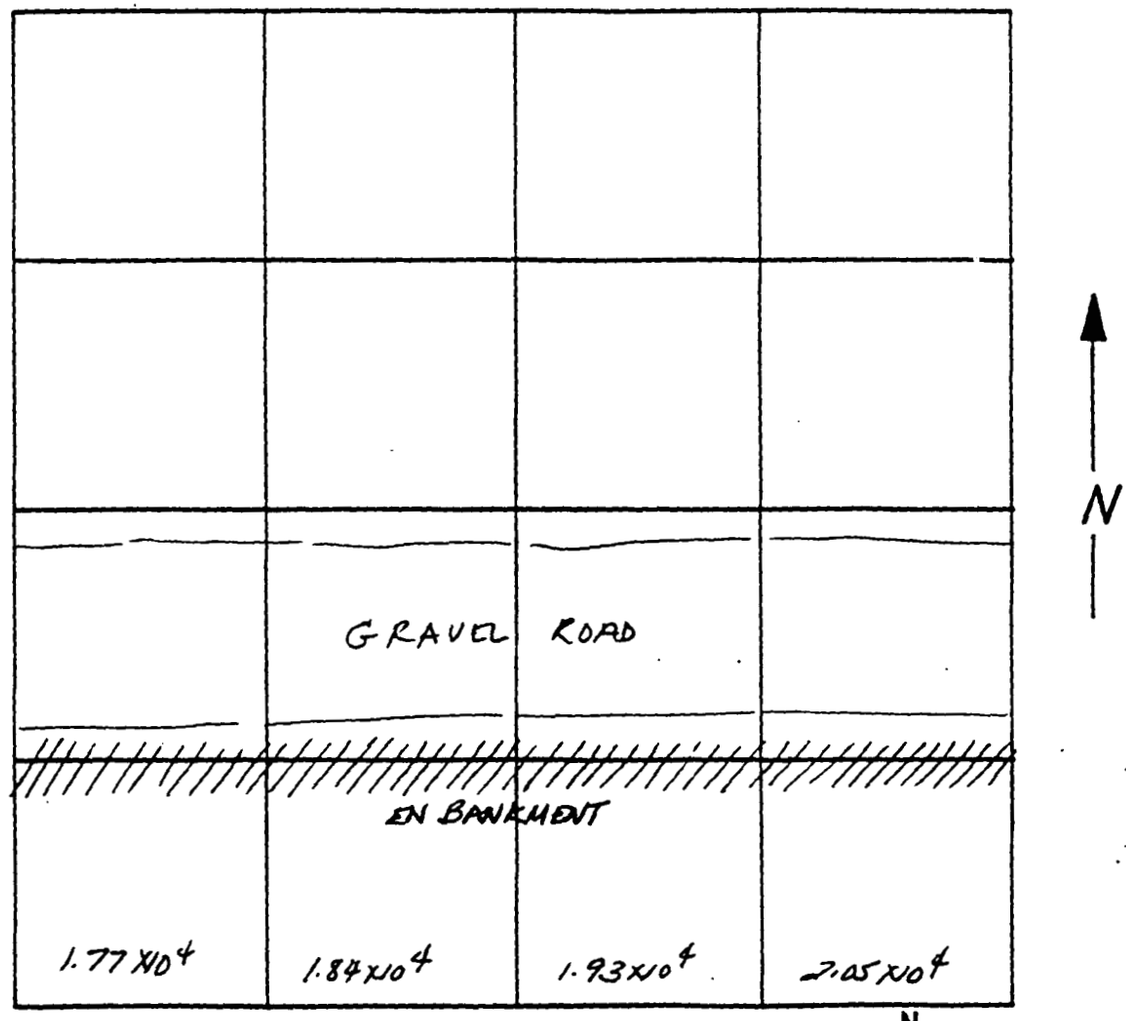
SURVEYORS: J. WHITESIDES

RECORDED BY: L. TRYBOSKI

COUNT TIME: 2 MIN. BACKGROUND: 1.42×10^4 CPM

N ____ E ____ CPM ____

N ____ E ____ CPM ____



N ____ E ____ CPM 7.93×10^3

N ____ E ____ CPM 9.61×10^3

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure ASL 2003 Rev. 1

SCALER MODEL ESP-1 SERIAL NO. 1795

PROBE MODEL SPA-3 SERIAL NO. 23

22

SPA3

153

FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	6	8	9
TIME	0	9	3	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole 180 Part A
SURVEYORS: J. WHITESIDES
RECORDED BY: L. TRYBOSKI
COUNT TIME: 3 MIN. BACKGROUND: ~~579~~ LT 1070 CPM

N____ N____
E____ E____

Manhole 180

3218	2290	2062	3128
2961	2715	3123	3557 / 3487
3247	3272	3743	3877 / 3800
3640	3740	3961	3772

N

N____ N____
E____ E____

COMMENTS: *FIDLER integrated counts in a 25' x 25' grid in accordance with procedure RSL 2004.*

SCALER MODEL 2220 SERIAL NO. ~~52838~~ 52838
PROBE MODEL G5 SERIAL NO. A 3034

FIDLER

23

153

FERNALD RI/FS Surface Measurements Field Logbook Form

DATE	0	5	0	6	8	9
TIME	1	2	3	5		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole 180 Part C
SURVEYORS: J. WHITESIDES, L. TRYBOSKI
RECORDED BY: LAURA TRYBOSKI, J. WHITESIDES
COUNT TIME: 3 MIN. BACKGROUND: ~~519 CT~~ 1070 CPM

N
E

N
E

4011	3857 4326	4053	3977
3841	4082	3963	3952
3799	4078 4154	3932	3994
3804	4022	3890	3972

N

N
E

N
E

COMMENTS: FIDLER integrated counts in a 25' x 25' grid in accordance with procedure RSL 2004.

FIDLER

SCALER MODEL 2220 SERIAL NO. 52838
PROBE MODEL G5 SERIAL NO. A3038

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INTERNATIONAL TECHNOLOGY CORPORATION

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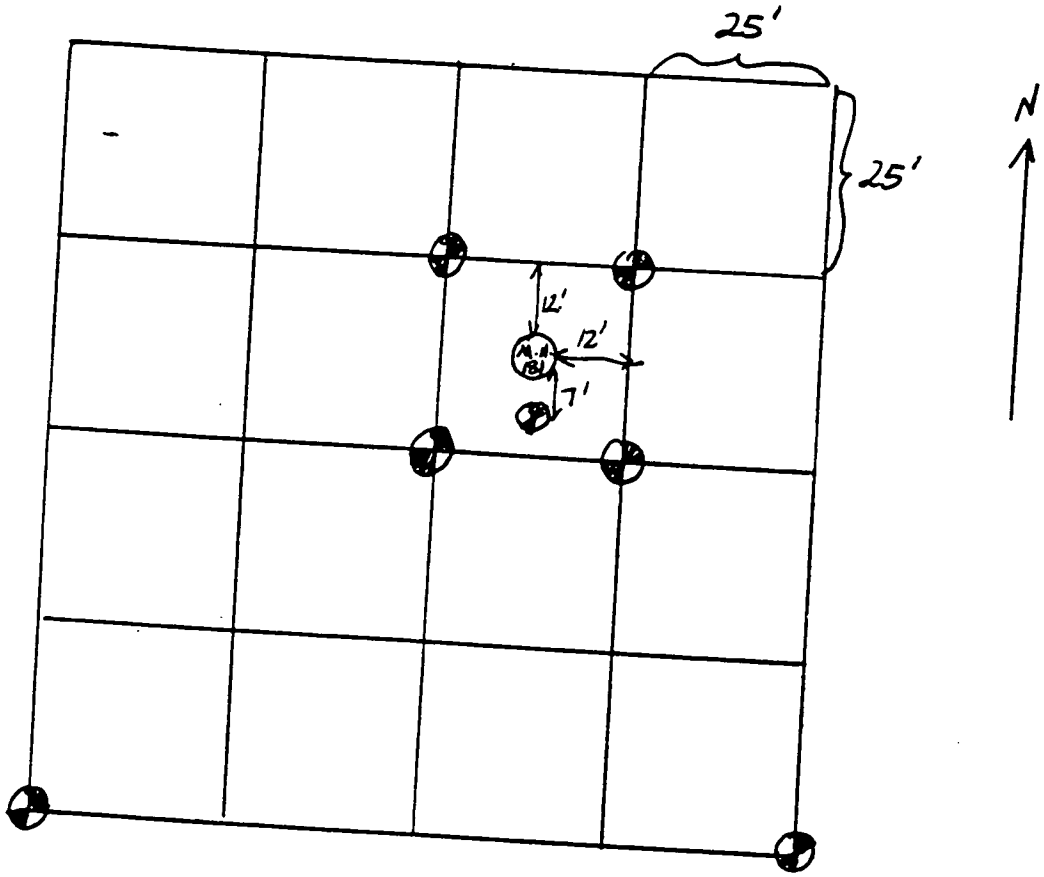
By LJT Date 5-7-89 Subject Manhole 181 Sheet No. 1 of 1

Chkd. By ____ Date ____ Soil Sample Locations Proj. No. 303317.09



⊘ - SAMPLE LOCATIONS
7 TOTAL

FERNALD RI/FS

Surface Measurements Field Logbook Form

DATE	0	5	0	5	8	9
TIME	0	8	0	0		
PAGE	OF					
PAGE						
CHKD. BY						

SITE: FMPC AREA: Manhole #181

SURVEYORS: L. Trybosk, J. Whitesides

RECORDED BY: J. Whitesides, L. Trybosk

COUNT TIME: 2 MIN. BACKGROUND: 1.15×10^4 CPM

N
E
CPM 7.34×10^3 at 1 meter

N
E
CPM 10.87×10^3 at 1 meter

Gravel Road 1.42×10^4	1.36×10^4	1.40×10^4	1.33×10^4
1.68×10^4	1.73×10^4	MANHOLE #181 1.81×10^4	1.72×10^4
1.73×10^4 ~~$1.72 \times$~~ LT	1.70×10^4	1.73×10^4	1.72×10^4
1.70×10^4	1.68×10^4	1.68×10^4	1.68×10^4

N

N
E
CPM 7.53×10^3 at 1 meter

N
E
CPM 2.96×10^3 at 1 meter

COMMENTS: SPA 3 25' x 25' grids integrated counts in accordance with procedure RSL 2003 Rev. 1

SPA3

SCALER MODEL ESP-1 SERIAL NO. 1794

PROBE MODEL SPA-3 SERIAL NO. 20

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FERNALD RI/FS

Surface Measurements Field Logbook Form

DATE	05 06 89
TIME	09 20
PAGE	OF
PAGE	
CHKD. BY	

SITE: FMPC AREA: Manhole # 181

SURVEYORS: L. Trybosk, J. Whitesides

RECORDED BY: J. Whitesides, L. Trybosk

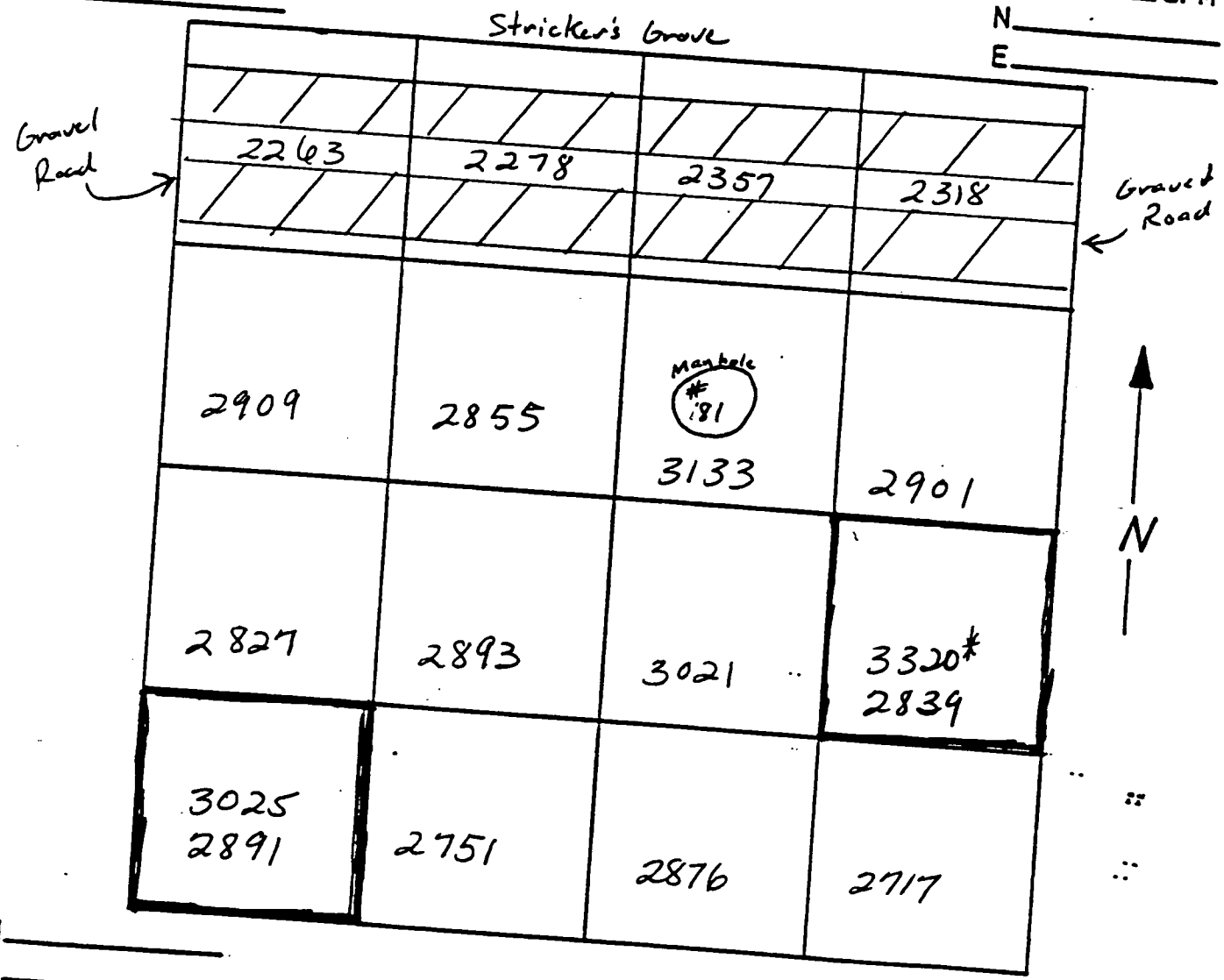
COUNT TIME: 3 MIN. BACKGROUND: 1070 CPM

N

E

N

E



N

E

N

E

COMMENTS: FIDLER integrated counts in a 25' x 25' grid in accordance with procedure RSL 2004.

* Reading was taken for: ~~2:00 minutes~~ ~~2 min 10 sec~~ LT 3 min 10 sec 6-22-

FIDLER

SCALER MODEL 2220 SERIAL NO. 52838

PROBE MODEL G5 SERIAL NO. A303K

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